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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/598,169	06/21/2000	Kenji Toyosawa	1035-270	6952

23117 7590 09/05/2003

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EXAMINER

VU, HUNG K

ART UNIT	PAPER NUMBER
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2811

DATE MAILED: 09/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/598,169

Applicant(s)

TOYOSAWA ET AL.

Examiner

Hung K. Vu

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✗

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 14-16,22 and 25-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 14-16,22 and 25-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Request for Continued Examination

1 A request for continued examination (RCE) under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 06/13/03 has been entered. An action on the RCE follows.

Claim Objections

2. Claims 14, 15, 22 and 26 are objected to because of the following informalities:

In claim 14, line 8, "a gate" should be changed to "said gate" for clarity.

In claim 15, line 7, "a gate" should be changed to "said gate" for clarity.

In claim 22, line 10, "a gate" should be changed to "said gate" for clarity.

In claim 22, line 11, between "the interlayer", insert --upper and lower--.

In claim 22, line 11, "film" should be changed to "films" for clarity.

In claim 26, line 2, "a gate" should be changed to "said gate" for clarity.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 14, 15, 22 and 25-26 are rejected under 35 U.S.C. 102(e) as being anticipated by Narui et al. (PN 6,150,689).

Narui et al. discloses, as shown in Figures 54, 55 and 61, a semiconductor device comprising:

an active element provided on a semiconductor substrate, the active element including at least two diffusion layers (15) and a gate electrode (8C);

a metal wiring layer (30A,30B) provided on the active element;

an interlayer insulating film (27,31,32) covering the active element;

a pad metal (41B) for an electrode pad being provided on the interlayer insulating film and substantially covering the at least two diffusion layers and the gate electrode of the active element, wherein the active element is on a side of the interlayer insulating film opposite to the pad metal;

a barrier metal layer provided on the active element with the interlayer insulating film therebetween, so that the pad metal is provided on the barrier metal layer and covering the active element, wherein:

the interlayer insulating film has at least a level difference compensating film for compensating a level difference of the metal wiring layer;

a portion of the level difference compensating film under the pad metal is removed.

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With regard to claim 15, Narui et al. discloses, as shown in Figures 54, 55 and 61, a semiconductor device comprising:

- an active element provided on a semiconductor substrate, the active element including at least two diffusion layers (15) and a gate electrode (8C);

- a metal wiring layer (30A,30B) provided on the active element;

- an interlayer insulating film (27,31,32) covering the active element;

- a pad metal (41B) for an electrode pad being provided on the interlayer insulating film and substantially covering the at least two diffusion layers and the gate electrode of the active element, wherein the active element is on a side of the interlayer insulating film opposite to the pad metal;

- a barrier metal layer provided on the active element with the interlayer insulating film therebetween, so that the pad metal is provided on the barrier metal layer and covering the active element, wherein:

- the interlayer insulating film has at least a level difference compensating film for compensating a level difference of the metal wiring layer;

- the level difference compensating film is formed to a minimum thickness necessary for compensating the level difference of the metal wiring layer.

With regard to claim 22, Narui et al. discloses, as shown in Figures 54, 55 and 61, a semiconductor device comprising:

- an active element provided on a semiconductor substrate, the active element including at least two diffusion layers (15) and a gate electrode (8C);

- a lower interlayer insulating film (17,18,19) formed to cover the active element;

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a metal wiring layer (30A,30B) provided on the lower interlayer insulating film;
an upper interlayer insulating film (27,31,32) formed to cover the metal wiring layer;
a pad metal (41B) for an electrode pad being provided on the upper interlayer insulating film and substantially covering the at least two diffusion layers and the gate electrode of the active element, wherein the active element is on a side of the upper interlayer insulating film opposite to the pad metal;

another metal wiring layer (35B) formed on the active element;
wherein each of the lower and upper interlayer insulating films have a trilaminar structure, each of a first layer and a third layer of the trilaminar film being silicon nitride film, while a second layer of the trilaminar film being formed of glass;

the second layer of the upper interlayer insulating film formed to a minimum thickness necessary for compensating the level difference of the metal wiring layer.

With regard to claim 25, Narui et al. discloses, as shown in Figures 54, 55 and 61, a semiconductor device comprising:

an active element provided on a semiconductor substrate, the active element including at least two diffusion layers (15) and a gate electrode (8C);

a first metal wiring layer (30A,30B) formed on the active element;
a plurality of other metal wiring layer (BL1,BL2,35,35B) above the active element;
a plurality of interlayer insulting films (29,31,32,38,39,40) each being provided between a pair of the metal wiring layers wherein the plurality of interlayer insulating films and plurality of other metal wiring layers are vertically aligned above the active element;

wherein each interlayer insulating film has a multilayer structure including at least a glass film sandwiched between insulating films formed of a silicon nitride film;

further wherein the film formed of glass in the interlayer insulating film being formed to a minimum thickness necessary for compensating a level difference of one of the metal wiring layers;

a pad metal (YS,41B) for an electrode pad being provided on the interlayer insulating film.

With regard to claim 26, Narui et al. discloses the pad metal substantially covers at least two diffusion layers and the gate electrode of the active element, and the active element is on a side of the interlayer insulting film opposite to the pad metal.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 16 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Narui et al. (PN 6,150,689) in view of Hosomi et al. (PN 5,773,888, of record).

With regard to claim 16, Narui et al. taught the invention substantially as claimed, including the semiconductor device as recited in the rejection of claim 14. Narui et al. does not teach a passivation film being covering a large part of the pad metal and an aperture in the passivation

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film having an edge adjacent an inside edge of the pad metal. However, Hosomi et al. taught a semiconductor device comprising a passivation film (3) being covering a large part of the pad metal (2) and an aperture (9) in the passivation film having an edge adjacent an inside edge of the pad metal [Figure 1 and Col. 4, lines 42-67]. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the device of Narui et al. having a passivation film being covering a large part of the pad metal and an aperture in the passivation film having an edge adjacent an inside edge of the pad metal, such as taught by Hosomi et al. in order to protect the device from external contamination.

With regard to claim 16, Narui et al. and Hosomi et al. taught the device further comprising another barrier metal layer (4) providing on the passivation film and the pad metal which is exposed by a window in the passivation film [Figure 1 and Col. 5, lines 1-15].

Response to Arguments

5. Applicant's arguments with respect to claims 14, 15, 22 and 25 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung K. Vu whose telephone number is (703) 308-4079. The examiner can normally be reached on Mon-Thurs 6:00-3:30, alternate Friday 7:00-3:30, Eastern Time.

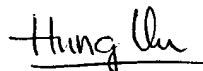
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (703) 308-2772. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Vu

August 21, 2003

A handwritten signature in cursive script, appearing to read "Hung Vu", written over a horizontal line.

Hung Vu

Patent Examiner